

Message Text

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TO AMEMBASSY BUCHAREST PRIORITY

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SUBJECT: NSF/NCST PROGRAM: NCST R & D PRIORITIES

REF: BUCHAREST 5753

1. NSF HAS CAREFULLY STUDIED THE LIST OF R&D PRIORITIES
SUPPLIED BY THE NCST. ALTHOUGH THE PRIORITIES IDENTIFIED
PLACE HEAVY EMPHASIS ON INDUSTRIAL TECHNOLOGY AND A NUMBER
OF ENTRIES LACK SUFFICIENT SPECIFICITY TO MAKE DEFINITIVE
JUDGEMENTS, NSF HAS IDENTIFIED THE FOLLOWING ITEMS IN EACH
CATEGORY WHICH COULD BE OF SCIENTIFIC INTEREST.

A. MACHINE BUILDING. ITEMS TWO THROUGH FIVE. NSF-SUPPOR-
TED RESEARCH PROGRAMS IN THIS CATEGORY ARE FOCUSED ON AD-
VANCED INDUSTRIAL PROCESSING, E.G., VERSATILE, PROGRAMMABLE
PRODUCTION TECHNOLOGIES; ADVANCES IN INDUSTRIAL AUTOMATION;
NEW PRODUCTION TECHNOLOGIES. SPECIFIC EXAMPLES OF RESEARCH
PROJECTS IN THE AREA ARE: OPTIMAL PLANNING OF COMPUTERIZED
MANUFACTURING SYSTEMS; ROBOT COMPUTATIONS FOR ORIENTING
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WORK PIECES; COMPUTER INTEGRATED ASSEMBLY SYSTEMS.

B. ELECTRONICS. ITEMS ONE, THREE, FIVE, EIGHT, TEN, ELE-
VEN, THIRTEEN, FOURTEEN, SIXTEEN. ALTHOUGH MUCH OF THE
SCIENTIFIC DEVELOPMENT WORK IN THIS CATEGORY IS BEING AC-

CCOMPLISHED BY U.S. INDUSTRY, NSF IS SUPPORTING BASIC RESEARCH IN SOME AREAS. EXAMPLES ARE: INTEGRATED CIRCUIT FABRICATION; INJECTION LASERS; DESIGN OF COMPONENTS FOR OPTICAL COMMUNICATIONS; ACOUSTIC NON-DESTRUCTIVE TESTING AND EVALUATION; ACOUSTIC TRANSDUCERS TO MEASURE PRESSURE AND ACOUSTIC WAVES; MICRO-PROCESSORS DESIGN AND EXPERIMENTS; NOISE STUDIES; THICK FILM CIRCUITS.

C. MINING, OIL GEOLOGY. AS IN CATEGORY B, U.S. INDUSTRY AND OTHER U.S. GOVERNMENT AGENCIES SUCH AS ERDA AND THE BUREAU OF MINES PERFORM MUCH OF THE SCIENTIFIC WORK IN THIS AREA. HOWEVER, ITEMS THREE, SIX, SEVEN, NINE, TEN, ELEVEN, TWELVE, THIRTEEN, FOURTEEN AND SIXTEEN FALL WITHIN SCIENTIFIC INVESTIGATIONS SUPPORTED BY NSF IN THE FIELDS OF EXCAVATION TECHNOLOGY AND RESOURCE RECOVERY. SOME SPECIFIC PROJECTS ARE: RAPID EXCAVATION BY ROCK MELTING; CONTROLLED BLASTING USING A LIGAMENTED TUBE AS A CHARGE CONTAINING DEVICE; IMPROVED FROTH FLOTATION FOR MINERAL PROCESSING; MECHANISM OF FLOCCULATION OF PHOSPHATIC SLIMES. IT IS NOTED THAT THE RESSE/NICOARA PROGRAM (FRR05/360), LOAD DEFORMATION CHARACTERISTICS OF PILE FOUNDATIONS FALLS WITHIN THIS CATEGORY.

D. BUILDING AND SEISMOLOGY. ITEMS ONE AND TWO. NSF SUPPORTS RESEARCH IN GEOPHYSICS ON EARTHQUAKE WAVES; GRAVITY VARIATIONS; HEAT FLOW; INTERNAL ELECTRIC CURRENTS; PAST AND PRESENT MAGNETIC FIELDS; BEHAVIOR OF ROCKS UNDER EXTREME UNCLASSIFIED

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TEMPERATURE AND PRESSURE; EARTHQUAKES. IN THE FIELD OF EARTHQUAKE ENGINEERING, THERE ARE PROJECTS TO ASSESS RISKS OF NON-EARTHQUAKE RESISTANT STRUCTURES; TWO DIMENSIONAL NONLINEAR BEHAVIOR OF TYPICAL BUILDING ELEMENTS; DESIGN AND ANALYSIS OF EARTHQUAKE PERFORMANCE OF LIFE LINE FACILITIES AND UTILITY, TRANSPORTATION, AND COMMUNICATION SYSTEMS; PRIVATE VULNERABILITY DECISIONS; ADAPTATION OF SEISMIC DESIGN AND ANALYSIS METHODS TO OTHER DYNAMIC HAZARDS TO BUILDINGS; DESIGN PROCEDURES THAT INTEGRATE EFFECTS OF MULTIPLE LOAD SOURCES AND TYPES. EXAMPLES OF SPECIFIC RESEARCH PROJECTS ARE: DESIGN MOTION SIMULATION CLOSE TO FAULTS; SEISMIC RESISTANCE OF PRECAST CONCRETE PANEL BUILDINGS; EVALUATION OF LIQUEFACTION POTENTIAL OF SATURATED GRANULAR SOILS.

E. POWER. ITEM FOUR. NSF IS NOT DIRECTLY SUPPORTING THE DEVELOPMENT OF RECYCLING AND WASTE RECOVERY TECHNOLOGIES SINCE THESE FALL WITHIN THE PROVINCE OF U.S. INDUSTRY AND OTHER U.S. GOVERNMENT AGENCIES SUCH AS THE ENVIRONMENTAL PROTECTION AGENCY (EPA) AND ERDA. HOWEVER, NSF DOES SUPPORT RESEARCH ON SELECTED MINERAL RESOURCE PROBLEMS, INCLUDING

ECONOMIC ANALYSIS, OPTIONS FOR EFFICIENT USE OF RESOURCES

AND TECHNOLOGICAL OPTIONS FOR MINERAL PROCESSING. FOR EXAMPLE, ONE PROJECT IS DIRECTED TOWARDS THE RECOVERY OF ZINC FROM PRIMARY SPRAY.

F. AGRICULTURE. ITEMS ONE THROUGH NINE. NSF DOES NOT SUPPORT AGRICULTURAL RESEARCH PER SE, SINCE THIS ACTIVITY FALLS WITHIN THE PURVIEW OF THE DEPARTMENT OF AGRICULTURE. NEVERTHELESS, NSF DOES SUPPORT BASIC RESEARCH IN ECOLOGY, SYSTEMATIC BIOLOGY AND ECOSYSTEMS, WHICH HAVE RELEVANCE FOR AGRICULTURE. PROJECT EXAMPLES ARE: APPLICATION OF IMMUNOFLOURESCENT STAINING TO THE ECOLOGY OF MICROORGANISMS; PRINCIPLES, STRATEGIES AND TACTICS OF PEST POPULATION REGULATION AND CONTROL IN MAJOR CROP ECOSYSTEMS; EFFECTS OF UNCLASSIFIED

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TEMPERATURE ON BUD DORMANCY; GENETIC AND AGRONOMIC STUDIES OF NATURAL POPULATIONS OF SIMMONDSIA CHINENSIS.

G. METALLURGY. ITEMS ONE, THROUGH FOUR. NSF SUPPORTS RESEARCH ON CERAMIC, METALLIC AND POLYMERIC MATERIALS EMPHASIZING THE RELATIONSHIP BETWEEN THEIR COMPOSITION AND STRUCTURE AND THE RESULTING MECHANICAL, ELECTRICAL, THERMAL AND OTHER PHYSICAL PROPERTIES. SOME RESEARCH PROJECT TITLES ARE: METALLURGICAL CHEMISTRY RELATED TO TREATMENT OF NON-FERROUS SULFIDE CONCENTRATIONS; HIGH TEMPERATURE PLASTIC FLOW IN A 15 SUPERCONDUCTING COMPOUNDS; DEPOSITION OF ALUMINUM BY PYROLYSIS OF ALUMINUM ALKYLs.

H. BIOLOGY. ITEMS ONE THROUGH NINE AND ELEVEN. NSF SUPPORTS RESEARCH IN THE FIELDS OF BIOCHEMISTRY; BIOPHYSICS; GENETIC BIOLOGY; DEVELOPMENTAL BIOLOGY; HUMAN CELL BIOLOGY; METABOLIC BIOLOGY; REGULATORY BIOLOGY; ENVIRONMENTAL BIOLOGY. FOR EXAMPLE, IN GENETIC BIOLOGY 3 AREAS OF SCIENTIFIC EMPHASIS INCLUDE; THE ORGANIZATION OF DNA SEQUENCES, THE ROLE OF CHROMOSOMAL PROTEINS IN CHROMOSOMAL STRUCTURE AND THEIR ROLE IN THE CONTROL OF GENE EXPRESSION AND FUNCTION, ETC.

I. ROAD TRANSPORT. THIS AREAS IS THE RESPONSIBILITY OF THE DEPARTMENT OF TRANSPORTATION.

2. AS AGREED DURING THE RECENT MEETING WITH AMBASSADOR NICOLAE, NSF WILL SEND A LETTER TO THE ROMANIAN EMBASSY ALONG THE LINES OF THIS TELEGRAM WHICH EMBOFF PETRESCU IS TO HAND CARRY TO BUCHAREST. IN ADDITION, NSF WILL SUPPLY PETRESCU WITH DOCUMENTS DETAILING THE CRITERIA FOR THE SELECTION OF RESEARCH PROJECTS AND A GUIDE TO NSF PROGRAMS.

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3. THE EMBASSY MAY WISH TO POINT OUT TO ROMANIAN OFFICIALS THAT THE TRADITIONAL ROLE OF NSF IS TO PROVIDE SUPPORT FOR A STRONG BASIC REPEAT BASIC RESEARCH CAPABILITY,

PARTICULARLY IN ACADEMIC INSTITUTIONS. OVER THREE-FIFTHS OF THE BASIC SCIENTIFIC RESEARCH IN THE US IS PERFORMED IN UNIVERSITIES AND COLLEGES. ON THE OTHER HAND, U.S. PRIVATE INDUSTRY IS THE LARGEST PERFORMER OF APPLIED RESEARCH AND DEVELOPMENT. SINCE MANY OF THE ITEMS ON THE NCST LIST FALL WITHIN THE APPLIED RESEARCH AND DEVELOPMENT CATEGORY, NSF, WITH ITS EMPHASES ON BASIC RESEARCH, HAS NOT INDICATED A SCIENTIFIC INTEREST. NEVERTHELESS, IT IS BELIEVED THAT A SUBSTANTIAL AREA OF COMMON INTERESTS HAS BEEN DELINEATED, AND IT IS HOPED THAT THIS INFORMATION WILL BE USEFUL IN DISCUSSIONS WITH MATAACHE, URSU AND OTHERS. VANCE

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